



Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

December 1, 2000

LIC-00-0103

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555

Reference: Docket No. 50-285

SUBJECT: Licensee Event Report 2000-002 Revision 0 for the Fort Calhoun Station

Please find attached Licensee Event Report 2000-002, Revision 0, dated December 1, 2000. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(ii)(A). If you should have any questions, please contact me.

Sincerely,

S. K. Gambhir
Division Manager
Nuclear Operations

SKG/epm

Attachment

c: E. W. Merschoff, NRC Regional Administrator, Region IV
L. R. Wharton, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector
INPO Records Center
Winston and Strawn

IE22

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

Fort Calhoun Nuclear Station Unit Number 1

DOCKET NUMBER (2)

05000285

PAGE (3)

1 OF 3

TITLE (4)

Plant Operation Outside of Low Temperature Overpressure Analysis Assumptions

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	01	2000	2000	-- 002	-- 0	12	01	2000		05000
										05000

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
		20.2201(b)	20.2203(a)(1)	20.2203(a)(2)(i)	20.2203(a)(2)(ii)	20.2203(a)(2)(iii)	20.2203(a)(2)(iv)	20.2203(a)(2)(v)	20.2203(a)(2)(vii)
4	0				X				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Thomas A. Heng, Supervisor, Reactor Physics and Reactor Engineering	402-533-7212

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 1, 2000, a Fort Calhoun Station (FCS) engineer was reviewing the station's low temperature overpressure protection (LTOP) analysis. The engineer noted that station operating procedures direct that the reactor coolant system (RCS) be taken water-solid to cool down the pressurizer when RCS temperature is below 200 degrees Fahrenheit. The LTOP analysis assumes that a steam volume is maintained in the pressurizer when RCS temperature is above 130 degrees Fahrenheit. This condition is reportable per 10 CFR 50.72(b)(2)(i).

The root cause of this event is the process for incorporating the LTOP analysis assumption on pressurizer level into the Technical Specifications failed to capture a key assumption in the operating procedures.

Shift and operations management were informed of the assumptions in the analysis and its implications for the plant. Procedures have been corrected to properly reflect the assumptions of the existing LTOP analysis.

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		2000	-- 002	-- 00	

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

BACKGROUND

In 1977, the Omaha Public Power District (OPPD) submitted an application for amendment to Facility Operating License for the Fort Calhoun Station (FCS) Technical Specifications (TS) that incorporated low temperature overpressure protection (LTOP).

At FCS, pressure transients that could occur at normal operating temperature and pressure conditions are mitigated by large code safety valves located on the pressurizer. These code safety valves are tested in accordance with American Society of Mechanical Engineers (ASME) Code, Section XI requirements. Two power-operated relief valves (PORV) are provided to limit the lifting frequency of the ASME Code safety valves by relieving pressurizer steam at 150 psi below the nominal safety valve setpoint.

The LTOP system used at FCS incorporates a defense in depth concept for reactor coolant system (RCS) overpressure protection utilizing operator training, administrative procedures, TS, and a protective system which automatically opens the PORVs to provide overpressure protection at lower pressures.

EVENT DESCRIPTION

On November 1, 2000, a Fort Calhoun Station (FCS) engineer was reviewing the station's low temperature overpressure protection (LTOP) analysis. The engineer noted that station operating procedures direct that the RCS be taken water-solid to cool down the pressurizer when RCS temperature is below 200 degrees Fahrenheit. The LTOP analysis assumes that a steam volume is maintained in the pressurizer when RCS temperature is above 130 degrees Fahrenheit.

On November 1, 2000, engineering personnel completed verification of the LTOP analysis performed for FCS and the effect on the station. At 1754 Central Standard Time (CST) it was determined that one of the design parameters in the analysis was not being maintained and that the condition was reportable. A four (4) hour non-emergency report was made to the NRC Operations Center at 1851 CST on November 1, 2000, pursuant to 10 CFR 50.72(b)(2)(i). This report is being made pursuant to 10 CFR 50.73(a)(2)(ii)(A).

SAFETY SIGNIFICANCE

Essentially all industry LTOP challenge events have occurred when the RCS was water-solid; typically due to mass addition or energy addition to the RCS. No low temperature overpressure event has occurred at FCS.

This event is significant in that operating procedures allow the LTOP system to be operated outside the analysis limits. This event is not as severe, however, as a loss of the LTOP system function. The LTOP function remained available to provide overpressure protection to the reactor coolant system (RCS) system.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

A review of the TS pressure-temperature (P/T) limit curves show that the P/T limit for FCS at 200 degrees Fahrenheit is about 540 pounds per square inch absolute (psia) at a cooldown rate of 30 degrees Fahrenheit per hour. A preliminary evaluation using the vendor recommended settings for the PORV trip setpoints was conducted shortly after the NRC notification. This evaluation indicated that if the RCS was at 200 degrees Fahrenheit, water-solid, and subject to the worst case LTOP transient, the calculated peak pressure would be about 555 psia. The calculated peak pressure is only slightly above the TS limit. Discussion between OPPD and Combustion Engineering (CE) indicated that margin exists in the assumptions used in the LTOP analysis. FCS has analyzed the LTOP accident scenario using a conservative set of assumptions that credits the margin indicated in the last sentence. These include using the more conservative FCS setpoints for the LTOP system verses the settings used in the CE LTOP analysis. This analysis demonstrated that the maximum pressure for an LTOP accident under the conditions listed above would be about 72.8 psi below the TS RCS P/T limit curve in the worst case. In addition, the limiting LTOP event, i.e., the start of an RCP, is prevented from occurring without at least a 53 percent pressurizer steam space by both TS and plant procedures. No offsite doses in excess of the 10 CFR 100 limits would occur. The health and safety of the general public is not affected. Therefore, it has been concluded that this condition would have no impact on the public and no impact on plant personnel.

CONCLUSION

The LTOP analysis (EA-89-64) contains an assumption that conflicts with plant operating procedures. The root cause of this event is that the process for incorporating the July 20, 1990, CE LTOP analysis assumption on pressurizer level into the TS P/T limit curve failed to capture a key assumption in the operating procedures. The assumption is to maintain a steam volume of at least 53 percent in the pressurizer until the RCS is cooled to 130 degrees Fahrenheit. The CE calculation entered the FCS design basis via a license amendment, but the assumption was not recognized as a requirement and procedures were not written to clearly identify it as a requirement. The key barrier that failed to prevent this was the engineering analysis acceptance procedure PED-QP-5, "Engineering Analysis Preparation, Review and Approval." PED-QP-5, as it existed at the time, did not require sufficient review of analysis assumptions and their impact on plant operation. (Note: this same conclusion was reached in connection with LER 95-002 and the procedure has been corrected since then.)

CORRECTIVE ACTIONS

At the time of discovery of this event the plant was shutdown to replace RCP seals and repair a thermal well in the pressurizer. Shift and operations management were informed of the assumptions in the analysis and the implications for plant operations. Plant procedures have been corrected to properly reflect the assumptions of the existing analysis. Additional corrective actions are covered by FCS's corrective action program.

SAFETY SYSTEM FUNCTIONAL FAILURE

This event did not result in a safety system functional failure in accordance with NEI 99-02, revision 0 .

PREVIOUS SIMILAR EVENTS

LERs 1988-016, 1988-037, 1990-015, 1991-022, 1995-002, 1996-003, and 1996-014.